

Abstract of the Disclosure

A parallel orthogonal frequency division multiplexed (OFDM) communications system includes a transmitter and receiver, the transmitter having a parallel fast Fourier transform (FFT) module operating in parallel to a conventional inverse fast Fourier transform (IFFT) module for providing respective orthogonal outputs received by the receiver. The receiver has a parallel IFFT module and a conventional FFT module for providing respective orthogonal outputs. The respective orthogonal outputs are combined to form a composite signal that provides improved insensitivity to relative frequency offsets and Doppler frequency offsets. The parallel FFT and IFFT modules in the OFDM communication system provides improved signal diversity and performance in the presence of relative frequency offsets and Doppler frequency offsets, and provides improved tracking capability for the receiver with backward compatibility.

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